

Sept. 4, 1934.

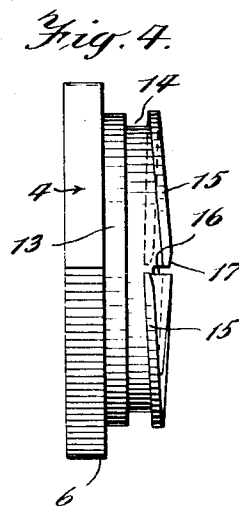
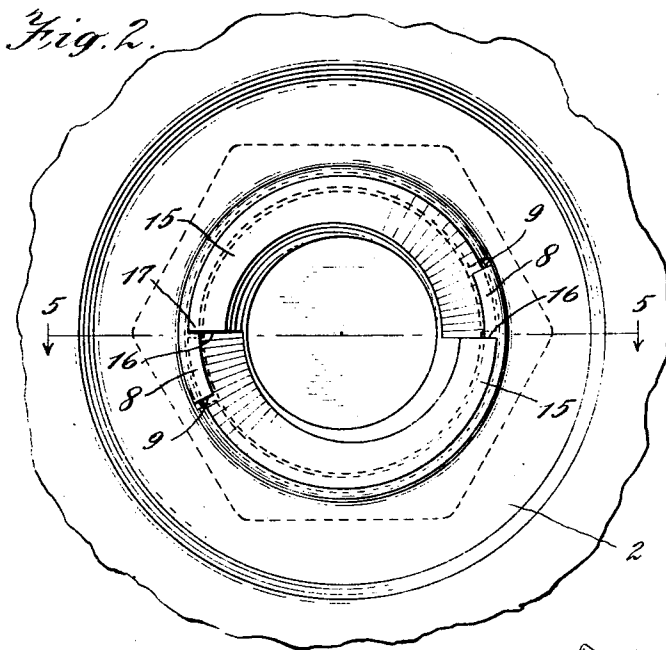
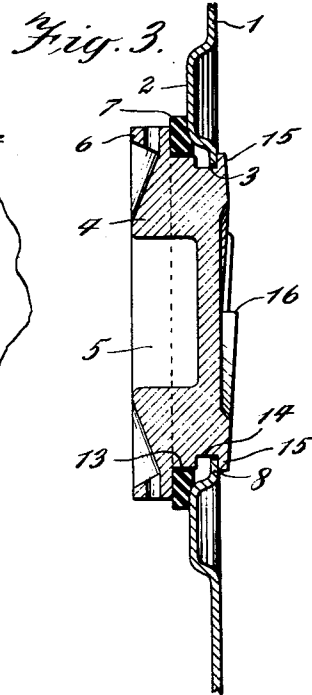
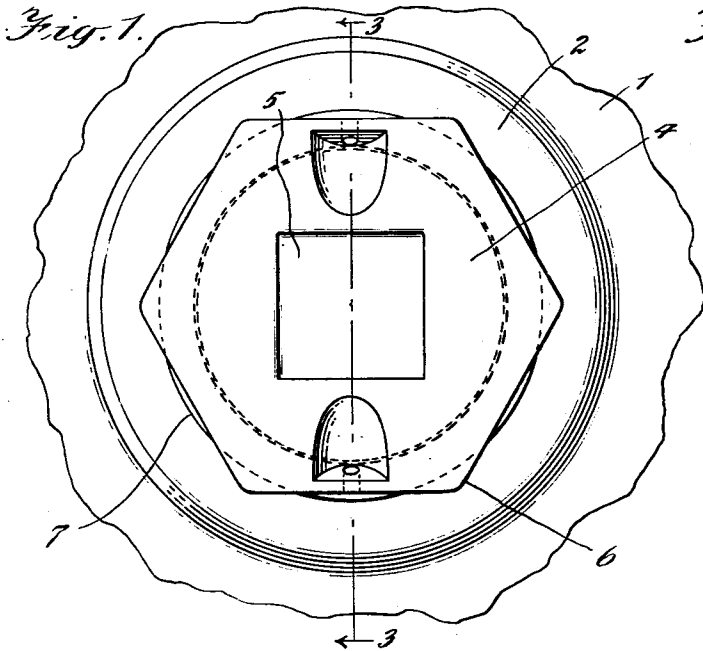
F. R. McCrudden

1,972,156

PLUG MOUNTING

Filed Feb. 11, 1932

2 Sheets-Sheet 1



INVENTOR
Frederick R. McCrudden
BY
Gifford, Scull & Burgess
ATTORNEYS

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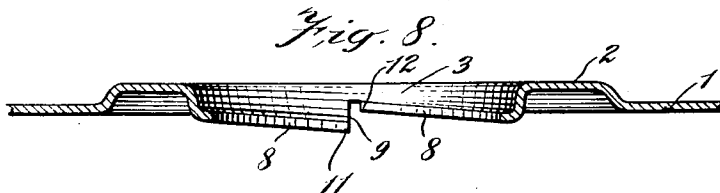
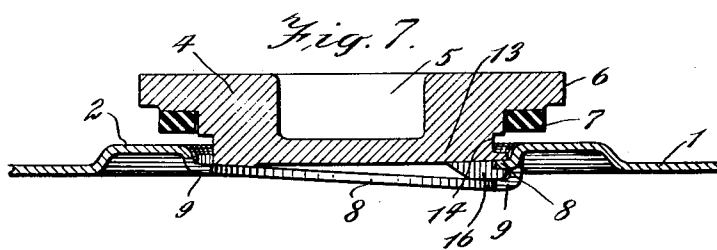
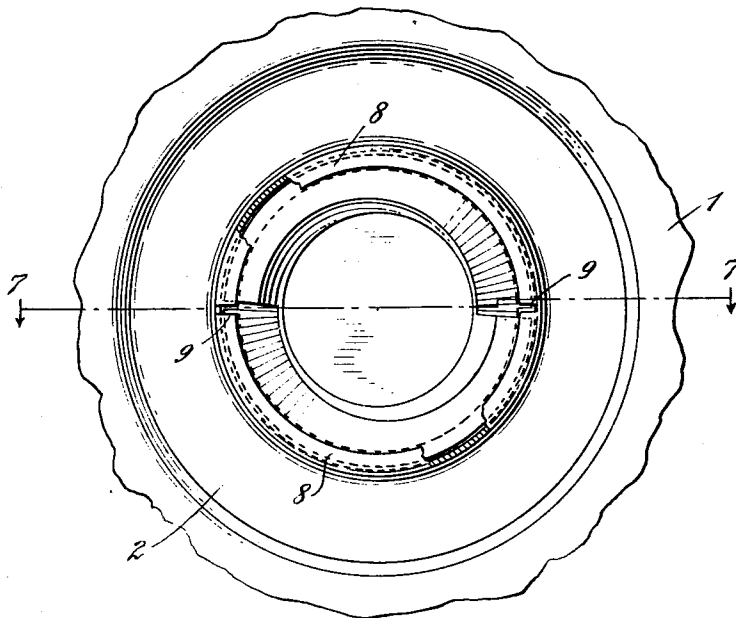
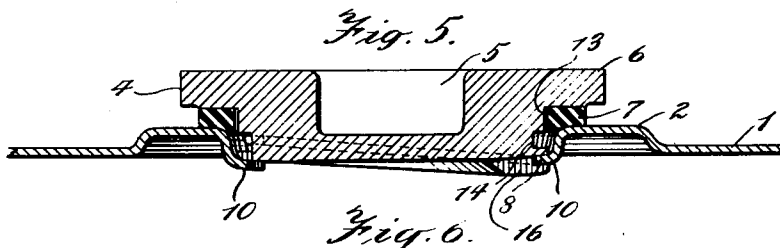
F. R. McCrudden

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PLUG MOUNTING

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2 Sheets-Sheet 2



INVENTOR
Frederick P. McCrudden
BY
Gifford, Lued & Burgess
ATTORNEYS

UNITED STATES PATENT OFFICE

1,972,156

PLUG MOUNTING

Frederick R. McCrudden, Moorestown, N. J., assignor to The National Lock Washer Company, Newark, N. J., a corporation of New Jersey

Application February 11, 1932, Serial No. 592,332

6 Claims. (Cl. 220—39)

This invention relates to a novel and improved type of plug mounting particularly adapted for use with sheet metal containers, and the novel features will be best understood from the following description and the annexed drawings, in which I have shown a selected embodiment of the invention, and in which:

Fig. 1 is a top view of a portion of a container having the invention applied thereto.

Fig. 2 is a view taken from the bottom of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is a side view of the plug detached from the mounting.

Fig. 5 is a section on the line 5—5 of Fig. 2.

Fig. 6 is a view similar to Fig. 2, but showing the parts in different position.

Fig. 7 is a section on the line 7—7 of Fig. 6.

Fig. 8 is a sectional view through the sheet of the container taken at approximately right angles to the plane of Fig. 7 and omitting the plug.

The invention is shown as used in connection with a container formed of sheet metal, the sheet being designated 1 and, in the form shown, being provided with a raised rib 2 annular in form and surrounding a hole 3 in the sheet. The hole is adapted to be closed by means of a plug 4 which may be provided with any suitable wrench-engaging portion 5, here shown as a recess, adapted to receive a wrench or other tool. The head is provided with an outwardly extending flange 6 overlying a portion of the rib 2, and between this flange and the rib is disposed a suitable washer 7 which is compressible so as to form a tight seal when the plug is secured in place.

The portion of the sheet adjacent the hole is turned inwardly to form an inwardly extending flange, and this flange is preferably formed in a plurality of substantially parallel sections 8, here shown as two, these sections being shown as oppositely disposed helixes as best seen in Fig. 8. In other words, the sections 8 are sections of screw threads and may be considered as parts of adjacent threads, it being seen that they are spaced apart by shoulders 9. That is, the lower surface 10 of each flange section may be considered as a cam surface, with the high end 11 of one cam separated from the low end 12 of an adjacent cam by a shoulder 9.

The plug is provided with a barrel 13 in the form of a cylinder, and in the surface of the cylinder is a groove 14, the lower boundary of which is formed by a flange extending outwardly from the barrel and comprising two sections 15 forming sections of threads adapted to engage with the sectional threads formed by the flange

sections 8. The flange sections 15 are, in turn, separated by shoulders 16, and here again the sections of threads formed by these flange sections may be considered as two cams having the high end of one separated from the low end of the other by a shoulder, and substantially parallel to each other and to the flange sections 8.

In operation, the plug is inserted in the hole with one of the shoulders 16 of the plug registering with one of the shoulders 9 of the sheet, and then upon rotation the high end 17 of one of the flange sections 15 will move into the space between the flange sections 8 and more particularly beneath the low end 12 of one of these sections. As the plug is rotated, the upper surfaces of the flange sections 15 will engage the under-surfaces of the flange sections 8 and serve to screw the plug into place, tightly holding the washer 7 against the rib 2, it being noted that the distance between adjacent ends of the flange sections 8 is such as to permit the flange sections 15 to pass therebetween. Similarly, the distance between adjacent ends of the flange sections 15 is such as to permit passage of the flange sections 8 therebetween.

In the above description, I have referred to the various parts as if Figs. 3, 5, and 7, for example, were vertical sections. This has been done for the sake of convenience in defining the relative positions of the different parts, and of course is not intended to be limiting in any way. In the claims, I shall also refer to the axis of the hole, by which I mean the axis through the center of the hole perpendicular to the sheet. I shall also refer to the wall surrounding the hole, by which is meant the portion of the sheet from which the flange sections 10 are bent inwardly.

The construction is one which is simple to make, because it may be formed by easily practiced, metal working steps of stamping and cutting, and it will be seen that no metal has to be removed in order to provide for the engagement of the cams on the plug with the cams on the mounting. This feature results from the fact that the substantially concentric cams or screw threads formed on the sheet, while of substantially equal radius, are spaced apart in a direction parallel to the axis of the hole to provide room for the entrance of corresponding cams or screw threads on the plug which are likewise substantially concentric and of substantially equal radius. Other advantages of the construction will be apparent to those skilled in the art.

While I have shown the invention as embodied

in a specific form, it is to be understood that various changes in details may be made without departing from the scope of the invention, and I therefore do not intend to limit myself except

5 by the appended claims.

I claim:

1. In combination, a metal sheet having a hole therethrough, a wall generally parallel to the axis of the hole and integral with said sheet, said
10 wall having parallel sections of threads on its inner face, with adjacent ends of adjoining sections spaced apart in a direction parallel to said axis but closely adjacent each other circumferentially, and a plug disposed within said hole
15 and having sections of threads of greater circumferential extent than the circumferential space between said adjacent ends of the wall thread sections, said plug thread sections being of a thickness such that upon rotation of the
20 plug they may pass between the thread sections on said wall.

2. In combination, a metal sheet having a hole therethrough, a wall generally parallel to the axis of the hole and integral with said sheet, a
25 plug adapted to be received within said hole and having outwardly extending inclined cams thereon, and separate inclined inwardly extending cams on said wall spaced apart in a direction
30 parallel to said axis for a distance greater than the thickness of said plug cams, the circumferential distance between adjacent ends of adjoining wall cams being less than the circumferential
35 extent of said plug cams, whereby said plug cams cannot engage said wall cams except upon rotation of the plug in the hole and whereby upon said rotation an extended contact is obtained between the cams on the plug and on the wall.

3. In combination, a metal sheet having a hole
40 therethrough, a wall generally parallel to the axis of said hole and integral with said sheet, said wall having a plurality of sections of inwardly extending threads spaced circumferentially of the hole, each section being less than
45 360° in extent but the combined circumferential length of said sections being approximately 360°, said sections being parallel to each other but spaced apart in a direction parallel to said axis, each section having a cam surface on the under
50 side thereof with the high end of one cam spaced from the low end of the cam on an adjacent section in a direction parallel to said axis, a plug adapted to close said hole, and outwardly extending thread sections on said plug having cam
55 surfaces on their upper faces adapted to contact with the cam surfaces on said wall thread sections and of less thickness than the distance between said high and low ends of said wall cams, whereby upon rotation of the plug in the hole the thread sections thereon may pass between
60 adjacent ends of the thread sections on the wall.

4. In combination, a metal sheet having a hole therethrough, a wall generally parallel to the axis of said hole and integral with said sheet, said wall
65 having a plurality of sections of inwardly extending threads spaced circumferentially of the hole, each section being less than 360° in extent but

the combined circumferential length of said sections being approximately 360°, said sections being parallel to each other but spaced apart in a direction parallel to said axis, each section having a cam surface on the under side thereof with the high end of one cam spaced from the low end of the cam on an adjacent section in a direction parallel to said axis, a plug adapted to close said hole, and outwardly extending thread sections on said plug having cam surfaces on their upper
80 faces adapted to contact with the cam surfaces on said wall thread sections and of less thickness than the distance between said high and low ends of said wall cams, whereby upon rotation of the plug in the hole the thread sections thereon may pass between adjacent ends of the thread sections on the wall, said thread sections on said plug being individually less than 360° in extent but having a combined circumferential length of approximately 360°.

5. In combination, a metal sheet having a hole therethrough, a wall generally parallel to the axis of said hole and integral with said sheet, said wall having a plurality of sections of inwardly extending threads spaced circumferentially of the hole, said sections being parallel to each other but spaced apart in a direction parallel to said axis, each section having a cam surface on the under side thereof with the high end of one cam spaced from the low end of the cam on an adjacent section in a direction parallel to said axis, a plug adapted to close said hole, and outwardly extending thread sections on said plug having cam surfaces on their upper faces adapted to contact with the cam surfaces on said wall
100 thread sections and of less thickness than the distance between said high and low ends of said wall cams, whereby upon rotation of the plug in the hole the thread sections thereon may pass between adjacent ends of the thread sections on the wall, the circumferential extent of each thread section on said plug being greater than the circumferential spacing between adjacent ends of adjoining thread sections on said wall.

6. In combination, a metal sheet having a hole
120 therethrough, a wall generally parallel to the axis of said hole and integral with said sheet, said wall having a plurality of sections of inwardly extending threads spaced circumferentially of the hole, said sections being parallel to each other but
125 spaced apart in a direction parallel to said axis, each section having a cam surface on the under side thereof with the high end of one cam spaced from the low end of the cam on an adjacent section in a direction parallel to said axis, a plug adapted to close said hole, and outwardly extending thread sections on said plug having cam surfaces on their upper faces adapted to contact with the cam surfaces on said wall thread sections and of less thickness than the distance between said high and low ends of said wall cams, whereby upon rotation of the plug in the hole the thread sections thereon may pass between adjacent ends of the thread sections on the wall, the thread sections on said plug and on said wall being of substantially equal circumferential extent.

FREDERICK R. McCRUDDEN.